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RIPv1 Applicability Statement for Historic Status

Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

Abstract

RIP Version 1 [RFC-1058] has been declared an historic document. This Applicability statement provides the supporting motivation for that declaration. The primary reason, as described below, is the Classful nature of RIPv1.

1.0 Introduction

RIP version 1 (RIPv1) (as defined by RFC 1058) was one of the first dynamic routing protocols used in the internet. It was developed as a technique for passing around network reachability information for what we now consider relatively simple topologies.

The Internet has changed significantly since RIPv1 was defined, particularly with the introduction and use of subnets and CIDR.

While RIPv1 is widely used in private networks, it can no longer be considered applicable for use in the global Internet.

2.0 RIPv1 restrictions

RIPv1 has a number of restrictions and behaviors which restrict its useability in the global Internet.

2.1 Classfulness

Chief among these is that it is a classful routing protocol. RIP packets do not carry prefix masks. The prefix length is inferred from the address. For non-local addresses, the prefix is always the "natural" (classful) length. (e.g., 24 bits for a "Class C" network address.) For networks to which a local interface exists, if the interface is subnetted with some specific mask, then RIPv1 assumes

that the mask used locally is the correct mask to apply for all subnets of that network.

This has a number of effects.

- 1) RIPv1 can not be used with variable length subnetting. In the presence of variable length subnetting it will consistently misinterpret prefix lengths.
- 2) RIPv1 is difficult to use with supernetting. All CIDR supernets must be exploded and advertised to RIPv1 as individual "natural" classful advertisements.
- 3) Even when the networks running RIPv1 are themselves only subnetted in fixed ways, if the remainder of the network has variable subnetting then one must carefully make sure that RIPv1 does not destroy the mask information when it passes through those subnets running RIPv1. Put another way, co-existence with mutual information exchange between RIPv1 and more advanced routing protocols is problematic at best. Note that this applies even when the other routing protocol is RIPv2.
- 4) The Internet will soon be making use of addresses which appear to RIPv1 to be parts of Class A networks. Networks using RIPv1 may not be able to reach all sites assigned the subsections of a single A.

2.2 Simple Distance Vector

RIPv1 is a simple distance vector protocol. It has been enhanced with various techniques, including Split Horizon and Poison Reverse in order to enable it to perform better in somewhat complicated networks.

However, being a simple distance vector protocol, it will run into difficulty. First and foremost, it will occasionally have to count to infinity in order to purge bad routes. This delays the convergence of routing. In order to keep this short, RIPv1 defines infinity as 16 hops. That means that networks with diameters larger than that can not use RIP. Even getting close to that limit can cause confusion for some implementations.

3.0 Conclusion

The recommendation of this Applicability statement is that if there is reason to run RIP in a network environment, one should use RIPv2 (RFC 1723).

RIPv1 itself should only be used in simple topologies, with simple reachability. It may be used by any site which uses fixed subnetting internally, and either uses a default route to deal with external traffic or is not connected to the global Internet or to other organizations.

RIPv1 may also be used as a local advertising technology if the information to be used fits within its capabilities.

4.0 Security Considerations

RIPv1 includes no security functions. RIPv2 includes a mechanism for authenticating the sender of the routing information. Sites which are worried about the vulnerability of their routing infrastructure and which feel they must run a RIP-like protocol should use RIPv2.

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